

CLAIMS

1. A reinforcing structure for automotive vehicles  
wherein a plurality of cross car beams  
arranged on the back of the instrument panel in the  
5 vehicle are supported by at least a brace erected on the  
vehicle floor,

wherein said cross car beams include an  
upper cross car beam of a hollow bar having a closed  
section suspended between left and right front pillars  
10 and a lower cross car beam of a hollow bar having a  
closed section bent in the shape of L, and

wherein the part of said lower cross car  
beam nearer to the driver's seat is in contact with said  
upper cross car beam, and the part of said lower cross  
15 car beam not in contact with said upper cross car beam  
functions as said brace.

2. A reinforcing structure for automotive vehicles  
according to claim 1,

wherein another lower cross car beam of a  
20 hollow bar having a closed section bent in the shape of L  
similar to the lower cross car beam nearer to the  
driver's seat is arranged nearer to the front passenger  
seat,

wherein a part of said another lower cross  
25 car beam is in contact with said upper cross car beam,  
and

wherein the part of said another lower  
cross car beam not in contact with said upper cross car  
beam functions as said brace.

30 3. A reinforcing structure for automotive vehicles  
according to claim 1,

wherein the part of said upper cross car  
beam and the part of said lower cross car beam in contact  
with each other are wholly or partly welded to each other  
35 in axial direction on both sides along the contact line  
therebetween.

4. A reinforcing structure for automotive vehicles

according to claim 1,

wherein a brace for supporting said upper cross car beam is arranged on the part of the central portion nearer to the front passenger seat.

5           5. A reinforcing structure for automotive vehicles according to claim 2,

wherein the part of said lower cross car beam nearer to the driver's seat and the part of said lower cross car beam nearer the front passenger seat are  
10           symmetric with each other.

6. A reinforcing structure for automotive vehicles according to claim 1,

wherein said upper cross car beam has a plurality of curved parts.

15           7. A reinforcing structure for automotive vehicles according to claim 1,

wherein the straight part of said L-shaped lower cross car beam is slightly curved.

20           8. A reinforcing structure for automotive vehicles according to claim 1,

wherein the closed section of each hollow bar constituting said upper cross car beam and said lower cross car beam is in the shape of selected one of a circle, an ellipse, a square, a rectangle or another  
25           polygon.

9. A reinforcing structure for automotive vehicles according to claim 8,

wherein a reinforcing bridge is arranged in each of said hollow bars.

30           10. A reinforcing structure for automotive vehicles according to claim 1,

wherein the closed sections of the hollow bar of said upper cross car beam and the hollow bar of said lower cross car beam have a selected one of the same  
35           and different shapes, areas and thickness.

11. A reinforcing structure for automotive vehicles according to claim 1,

wherein said upper cross car beam and said lower cross car beam are arranged in arbitrary relative positions including superposition and juxtaposition.

5       12. A reinforcing structure for automotive vehicles according to claim 1,

          wherein a steering shaft is mounted on said cross car beams in the direction crossing said cross car beams, and

10       wherein said steering shaft is arranged between said upper cross car beam and said lower cross car beam.

          13. A reinforcing structure for automotive vehicles wherein a plurality of cross car beams arranged on the back of the instrument panel in the vehicle are supported by at least a brace erected on the vehicle floor,

          wherein said cross car beams include an upper cross car beam of a hollow bar having a closed section suspended between left and right front pillars and a lower cross car beam of a hollow bar having a closed section bent in the shape of L, and

20       wherein the part of said lower cross car beam nearer to the driver's seat is arranged in spaced and substantially parallel relation with said upper cross car beam, and the remaining part of said lower cross car beam functions as said brace, and

25       wherein said upper cross car beam and said lower cross car beam are coupled to each other by at least a stay.

30       14. A reinforcing structure for automotive vehicles according to claim 13,

          wherein an L-shaped lower cross car beam of a hollow bar having a closed section similar to the L-shaped lower cross car beam nearer to the driver's seat is arranged nearer to the front passenger seat,

35       wherein a part of said lower cross car beam is arranged in spaced and substantially in parallel

relation with said upper cross car beam, and the other part of said lower cross car beam functions as said brace, and

5 wherein said upper cross car beam and said lower cross car beam are coupled to each other by at least a stay.

15. A reinforcing structure for automotive vehicles according to claim 13,

10 wherein a brace for supporting said upper cross car beam is arranged on the part of the central portion nearer to the front passenger seat.

16. A reinforcing structure for automotive vehicles according to claim 14,

15 wherein the part of said lower cross car beam nearer to the driver's seat and the part of said lower cross car beam nearer to the front passenger seat are symmetric with each other.

17. A reinforcing structure for automotive vehicles according to claim 13,

20 wherein said upper cross car beam has a plurality of curved parts.

18. A reinforcing structure for automotive vehicles according to claim 13,

25 wherein the straight part of said L-shaped lower cross car beam is slightly curved.

19. A reinforcing structure for automotive vehicles according to claim 13,

30 wherein the closed section of each hollow bar constituting said upper cross car beam and said lower cross car beam is in the shape of selected one of a circle, an ellipse, a square, a rectangle or another polygon.

20. A reinforcing structure for automotive vehicles according to claim 19,

35 wherein a reinforcing bridge is arranged in each of said hollow bars.

21. A reinforcing structure for automotive vehicles

according to claim 13,

wherein the closed sections of the hollow bar of said upper cross car beam and the hollow bar of said lower cross car beam have selected one of the same and different shapes, areas and thickness.

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22. A reinforcing structure for automotive vehicles according to claim 13,

wherein said upper cross car beam and said lower cross car beam are arranged in arbitrary relative positions including superposition and juxtaposition.

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23. A reinforcing structure for automotive vehicles according to claim 13

wherein a steering shaft is mounted on said cross car beams in the direction crossing said cross car beams, and

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wherein said steering shaft is arranged between said upper cross car beam and said lower cross car beam.

24. A reinforcing structure for automotive vehicles

wherein a plurality of cross car beams arranged on the back of the instrument panel and suspended between left and right front pillars in the vehicle are supported by at least a brace erected on the vehicle floor,

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wherein said cross car beams include an upper cross car beam of a hollow bar having a closed section suspended between the left and right front pillars and two lower cross car beams each of a hollow bar having a closed section bent in the shape of L,

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wherein selected one of the lower cross car beam nearer to the driver's seat and the lower cross car beam nearer to the front passenger seat is partially in contact and welded with said upper cross car beam along the contact line, and

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wherein a part of the other lower cross car beam nearer to the driver's seat or the front passenger seat, as the case may be, is arranged in spaced

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and substantially parallel relation with said upper cross car beam, and said part of said other lower cross car beam and said upper cross car beam are coupled to each other by at least a stay.

5           25. A reinforcing structure for automotive vehicles according to claim 24,

                  wherein said upper cross car beam has a plurality of curved portions.

10           26. A reinforcing structure for automotive vehicles according to claim 24,

                  wherein the straight part of said L-shaped lower cross car beam is slightly curved.

                  27. A reinforcing structure for automotive vehicles according to claim 24,

15                       wherein the closed section of each hollow bar constituting said upper cross car beam and said lower cross car beam is in the shape of selected one of a circle, an ellipse, a square, a rectangle and other polygons.

20           28. A reinforcing structure for automotive vehicles according to claim 27,

                  wherein a reinforcing bridge is arranged in said hollow bar.

25           29. A reinforcing structure for automotive vehicles according to claim 24,

                  wherein the closed sections of the hollow bar of said upper cross car beam and the hollow bar of said lower cross car beam have selected one of the same and different shapes, areas and thickness.

30           30. A reinforcing structure for automotive vehicles according to claim 24,

                  wherein said upper cross car beam and said lower cross car beam are arranged in arbitrary relative positions including superposition and juxtaposition.

35           31. A reinforcing structure for automotive vehicles according to claim 24,

                  wherein a steering shaft is mounted on

said cross car beams in the direction crossing said cross car beams, and said steering shaft is arranged between said upper cross car beam and said lower cross car beam.